

**IN THE CLAIMS:**

1 1. (CURRENTLY AMENDED) An intermediate network device having a plurality of  
2 ports for sending and receiving network messages to and from one or more entities of a  
3 computer network at least some of which are segregated into a plurality of virtual local  
4 area network (VLANs) defined within the computer network, the intermediate network  
5 device comprising:

6 a compact-Generic Application Registration Protocol (GARP) VLAN Registra-  
7 tion Protocol (GVRP) application component associated with a selected port, the com-  
8 pact-GVRP application component having:

9 a GARP Information Declaration (GID) component configured to main-  
10 tain VLAN registration state for the selected port in response to receiving attribute  
11 events for the VLANs;

12 a compact-GVRP encoder/decoder unit; and

13 a GVRP PDU message generator, wherein

14 the compact-GVRP encoder/decoder unit is configured to compute ~~an~~-encoded  
15 values, in accordance with an encoding algorithm that encodes a plurality of, ~~for the~~ at-  
16 tribute events that are each associated with a different VLAN of a given set of VLANs  
17 into each encoded value, and

18 the GVRP PDU message generator loads the encoded values computed for all of  
19 the VLANs defined within the computer network within a single GVRP PDU message  
20 for transmission from the selected port.

1 2. (PREVIOUSLY PRESENTED) An intermediate network device as defined in claim 1  
2 wherein the encoding algorithm is a number base conversion algorithm.

1 3. (PREVIOUSLY PRESENTED) An intermediate network device as defined in claim 2  
2 wherein the number base conversion algorithm is

3     $((((E_X \times 5 + E_{X+1}) \times 5 + E_{X+2}) \times 5 + E_{X+3}) \times 5 + E_{X+4}) \times 5 + E_{X+5})$  and wherein  $E_X$  corre-  
4    sponds to the attribute event for the first VLAN in the set,  $E_{X+1}$  corresponds to the attrib-  
5    ute event for the second VLAN in the set,  $E_{X+2}$  corresponds to the attribute event for the  
6    third VLAN in the set,  $E_{X+3}$  corresponds to the attribute event for the fourth VLAN in the  
7    set,  $E_{X+4}$  corresponds to the attribute event for the fifth VLAN in the set, and  $E_{X+5}$  corre-  
8    sponds to the attribute event for the sixth VLAN in the set.

1    4. (PREVIOUSLY PRESENTED) An intermediate network device as defined in claim 1  
2    wherein the compact-GVRP encoder/decoder unit is configured to decode an encoded  
3    value contained in a compact-GVRP PDU message, that was encoded using the encoding  
4    algorithm, to yield attribute event information for a set of VLANs.

1    5. (PREVIOUSLY PRESENTED) An intermediate network device as defined in claim 1  
2    wherein the compact-GVRP application component is configured to generate and send a  
3    GVRP PDU message containing a just\_kidding message.

1    6. (CURRENTLY AMENDED) An intermediate network device as defined in claim 5  
2    further comprising:  
3        a leave timer;  
4        a just\_kidding timer; and  
5        a just\_kidding state machine,  
6        wherein ~~upon sending the GVRP PDU message containing the just\_kidding mes-~~  
7    ~~sage the just\_kidding state machine is configured to start~~ starts the leave timer and to re-  
8    start-re-starts the just\_kidding timer upon sending the GVRP PDU message containing  
9    the just\_kidding message.

1    7. (CURRENTLY AMENDED) An intermediate network device as defined in claim 6  
2    comprising:

3           a leave\_all timer; and  
4           a leave\_all state machine,  
5           ~~wherein upon expiration of the leave\_all timer~~ the leave\_all state machine is con-  
6 figured to enter ~~enters~~ an active state upon sending the GVRP PDU message containing  
7 the just\_kidding message and the compact-GVRP application component is configured to  
8 generate ~~generates and sends~~ send a GVRP PDU message that is configured to cause  
9 network entities that receive it to respond with one or more GVRP PDU messages.

1   8. (PREVIOUSLY PRESENTED) An intermediate network device as defined in claim 7  
2   wherein the leave timer is set to a high value relative to the leave\_all timer.

1   9. (CURRENTLY AMENDED) An intermediate network device as defined in claim 7  
2   comprising:

3           a mode selection unit configured to be in one of a compatible mode, a fast com-  
4   pact mode or a slow compact mode,

5           wherein the mode selection unit is configured to enter the compatible mode if af-  
6   ter the compact-GVRP application component sends the GVRP PDU message containing  
7   a just\_kidding message and the mode selection unit is either in the fast compact mode or  
8   the slow compact mode and the compact-GVRP application component receives a con-  
9   ventional GVRP PDU message, ~~the mode select unit enters the compatible mode.~~

1   10. (CURRENTLY AMENDED) An intermediate network device as defined in claim 7  
2   comprising:

3           a port partner variable configured to hold a source identifier,

4           wherein the compact-GVRP application component is configured to place the  
5 source identifier in the port partner variable upon processing a received GVRP PDU mes-  
6   sage containing a negotiation message with a source identifier ~~the compact GVRP appli-~~  
7 ~~cation component places the source identifier in the port partner variable.~~

1 11. (CURRENTLY AMENDED) An intermediate network device as defined in claim 10  
2 wherein the compact-GVRP application is configured to enter a slow compact mode upon  
3 processing a received GVRP PDU message containing a negotiation message with a  
4 source identifier that does not match the content of the port partner variable, ~~the compact~~  
5 ~~GVRP application enters the slow compact mode.~~

1 12. (CURRENTLY AMENDED) An intermediate network device as defined in claim 10  
2 wherein the compact-GVRP application is configured to enter a fast compact mode upon  
3 processing a received GVRP PDU message containing a negotiation message with a  
4 source identifier that matches the content of the port partner variable, ~~the compact GVRP~~  
5 ~~application enters the fast compact mode.~~

1 13. (CURRENTLY AMENDED) An intermediate network device as defined in claim 1  
2 wherein the compact-GVRP application component is configured to generate a mixed  
3 format GVRP PDU message containing a conventional attribute structure ~~and a vector~~  
4 ~~message~~ as well as fields loaded with the encoded values.

1 14. (CURRENTLY AMENDED) In an intermediate node having a plurality of ports for  
2 sending and receiving network messages to and from one or more entities of a computer  
3 network at least some of which are segregated into a plurality of virtual local area net-  
4 work (VLANs) defined within the computer network, a method for conveying VLAN  
5 membership information comprising the steps of:

6 for a given set of VLANs defined within the computer network, computing an en-  
7 coded value, in accordance with an encoding algorithm that encodes a plurality of, ~~for~~  
8 attribute events that are each associated with a different VLAN of ~~associated with the~~  
9 given set of VLANs into the encoded value; and

10 loading encoded values for all of the VLANs defined within the computer net-  
11 work into a single GVRP PDU message for transmission at one or more ports in the plu-  
12 rality of ports.

1 15. (PREVIOUSLY PRESENTED) A method as defined in claim 14 further comprising  
2 the step of:  
3 decoding an encoded value, that was encoded using the encoding algorithm and is  
4 contained in a compact-GVRP PDU message, to yield attribute event information for a  
5 set of VLANs.

1 16. (PREVIOUSLY PRESENTED) A method as defined in claim 14 further comprising  
2 the steps of:  
3 generating a GVRP PDU message containing a just\_kidding message;  
4 sending the GVRP PDU message containing the just kidding message out one or  
5 more ports of the plurality of ports; and  
6 restarting a just\_kidding timer.

1 17. (PREVIOUSLY PRESENTED) A method as defined in claim 16 further comprising  
2 the step of:  
3 entering a slow compact mode upon the expiration of the just\_kidding timer and  
4 the non-receipt of a conventional GVRP PDU message.

1 18. (PREVIOUSLY PRESENTED) A method as described in claim 16 further compris-  
2 ing the steps of:  
3 entering one of a slow compact mode or a fast compact mode;  
4 receiving a conventional GVRP PDU message; and  
5 reverting to a compatible mode.

1 19. (PREVIOUSLY PRESENTED) A method as defined in claim 14 comprising the  
2 steps of:  
3 receiving a first compact-GVRP PDU message wherein the first compact-GVRP  
4 PDU message contains a first source identifier.

1 20. (PREVIOUSLY PRESENTED) A method as defined in claim 19 comprising the  
2 steps of:  
3 receiving a second compact-GVRP PDU message wherein the second compact-  
4 GVRP PDU message contains a second source identifier that does not match the first  
5 source identifier; and  
6 entering a slow compact mode.

1 21. (PREVIOUSLY PRESENTED) A method as defined in claim 19 comprising the  
2 steps of:  
3 receiving a second compact-GVRP PDU message wherein the second compact-  
4 GVRP PDU message contains a second source identifier that matches the first source  
5 identifier; and  
6 entering a fast compact mode.

1 22. (CURRENTLY AMENDED) An apparatus having a plurality of ports for sending  
2 and receiving network messages to and from one or more entities of a computer network  
3 at least some of which are segregated into a plurality of virtual local area network  
4 (VLANs) defined within the computer network, the apparatus comprising:  
5 means for maintaining VLAN registration state for a selected port in response to  
6 receiving attribute events for the VLANs;  
7 means for computing an encoded value, in accordance with an encoding algorithm  
8 that encodes a plurality of, ~~for~~ attribute events that are each associated with a different  
9 VLAN of a given set of VLANs into the encoded value;

10 means for loading encoded values for all of the VLANs defined within the com-  
11 puter network into a single GVRP PDU message for transmission from a port in the plu-  
12 rality of ports.

1 23. (CURRENTLY AMENDED) A computer readable medium comprising computer  
2 executable instructions for:

3 computing an encoded value, in accordance with an encoding algorithm that en-  
4 codes a plurality of, ~~for~~ attribute events that are each associated with a different VLAN  
5 of a given set of VLANs into the encoded values; and

6 loading encoded values for all of the VLANs defined within the computer net-  
7 work into a single GVRP PDU message for transmission from a port in the plurality of  
8 ports.